UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,380	01/03/2002	Eung Tae Kim	K-0387	8668

34610 7590 08/22/2005

FLESHNER & KIM, LLP
P.O. BOX 221200
CHANTILLY, VA 20153

EXAMINER	
AN, SHAWN S	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/034,380	KIM, EUNG TAE	
	Examiner	Art Unit	
	Shawn S. An	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22 and 30-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,7,18,19,22 and 30-41* is/are rejected.

7)☒ Claim(s) *3-6,8-17,20 and 21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. As per Applicant's instructions as filed on 2/23/05, claims 1-2, 7-8, 13, 15, 17-19, and 21-22 have been amended, claims 23-29 have been canceled, and claims 30-41 have been newly added.

Response to Remarks/Arguments

2. Applicant's remarks filed on 2/23/05 have been fully considered but they are not persuasive.

The Applicant presents arguments of which Eyuboglu et al, Wells et al, Florencio et al, wine et al, and Golin's references fail to teach or suggest:

A) a parameter control unit detecting information about a picture from a previous bit stream VLD by the decoder and setting up an encoding mode (Inter/Intra) for a transcoding in accordance with the detected information;

B) a video preprocessing unit having a predetermined matrix structure and down-sampling a macroblock decoded by the video decoder by transforming the macroblock into a corresponding picture structure;

C) a video encoder for encoding down sampled data stored in the frame memory by macroblock unit in accordance with the encoding mode outputted from the transcoding parameter control unit;

D) a bit rate control unit controlling quantization of the video encoder by calculating a bit amount encoded substantially by every picture among a bit stream to the decoded currently by the video decoder and finding a fullness of a buffer in the video encoder using the calculated bit amount.

E) claim 2 limitation; and

F) claim 7 limitation.

Furthermore, the Applicant argues impermissable hindsight.

However, after careful scrutiny of Eyuboglu et al, Wells et al, Florencio et al, wine et al, and Golin's references et al's references, the Examiner must respectively disagree, and maintain the grounds of rejection for the reasons that follow.

In response to argument A), Eyuboglu et al clearly discloses a transcoding parameter control unit (616 via 602) detecting information about a picture (side information) from a previous bit stream VLD by the decoder (Fig. 6, 602) and setting up an encoding mode (Inter/Intra) (616) for a transcoding in accordance with the detected information (col. 7, lines 6-20).

In response to argument B), Wells et al teaches a video transcoder comprising a video preprocessing unit (Fig. 2, 20) having a predetermined matrix structure and down-sampling a macroblock (col. 3, lines 10-67 and col. 4, lines 1-31) decoded by the video decoder (18) by transforming the pictures into a corresponding picture structure (col. 11, lines 39-49).

In response to argument C), Eyuboglu et al discloses a video encoder (608) for encoding data stored in the frame memory (614) by macroblock unit (col. 7, lines 6-20) in accordance with the encoding mode outputted from the transcoding parameter control unit (616 via 602).

In response to argument D), Florencio et al teaches a bit rate control unit (Fig. 3, elements 32, 34) controlling quantization (Fig. 10, 172) of the video encoder (174) by calculating a bit amount encoded (Fig. 11, 178) substantially by every picture (slice; picture comprises slices) among a bit stream to the decoded currently by the video decoder (32) and finding a fullness of a buffer in the video encoder (34) using the calculated bit amount (col. 4, lines 9-25).

In response to argument E), as amended, in an encoding standard such as MPEG, a field based processing utilizes an interlacing sequence, whereas a frame based processing utilizes a sequential (progressive) scanning sequence.

Therefore, it would have been obvious for Wells et al's video preprocessing unit would carry out down sampling through a field based processing if the data decoded in the video decoder is a frame picture in an interlacing sequence or carry out down sampling through a frame based processing if the data decoded in the video decoder is

a field picture having a sequential scanning sequence in order to conform with the encoding standard.

In response to argument F), Eyuboglu et al teaches a transcoding parameter control unit (616) and a motion vector (Fig. 6, see MOTION VECTORS) of a macroblock using motion information of a previous bit stream decoded by the video decoder (602).

Furthermore, Golin teaches a transcoding parameter control unit (Fig. 2, 205) and a motion vector of a macroblock using motion information of a previous bit stream decoded by the video decoder (202) (col. 3, lines 1-59). Golin also teaches multiple motion vectors being associated with a given block in some prediction (motion) modes, such as field prediction and dual prime for P-pictures, and deciding whether to use forward and/or backward prediction for B-pictures (col. 6, lines 27-39).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing Eyuboglu et al's trancoding scheme to incorporate the teaching of Golin so that the transcoding parameter control unit establishes the motion vector and the motion mode of the macroblock down-sampled by Well et al's preprocessing unit using motion information of the previous bit stream variable length decoded by the video decoder as a most efficient way to determine a transcoding parameter.

Moreover, In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 30, 32-35, and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyuboglu et al (5,541,852) in view of Wells et al (6,310,915 B1) and Florencio et al (6,621,866 B1).

Regarding claims 1 and 30, Eyuboglu et al discloses a video transcoding apparatus (Fig. 6, 402), comprising:

a video decoder (602) for decoding a compressed video bit stream so as to reconstruct a pixel value of an original scene;

a frame memory (614) for storing the macro block;

a transcoding parameter control unit (616 via 602) detecting information about a picture from a previous bit stream VLD by the decoder and setting up an encoding mode (Inter/Intra) for a transcoding in accordance with the detected information (Fig. 6, col. 7, lines 6-20);

a video encoder (608) for encoding data stored in the frame memory (614) by macroblock unit in accordance with the encoding mode outputted from the transcoding parameter control unit;

Eyuboglu et al does not particularly disclose a video preprocessing unit having a predetermined matrix structure and down-sampling a macroblock decoded by the video decoder by transforming the macroblock into a corresponding picture structure to the compressed video bit stream, and

a bit rate control unit controlling quantization of the video encoder by calculating a bit amount encoded substantially by every picture among a bit stream to the decoded currently by the video decoder and finding a fullness of a buffer in the video encoder using the calculated bit amount.

However, Wells et al teaches a video transcoder comprising a video preprocessing unit (Fig. 2, 20) having a predetermined matrix structure and down-

sampling a macroblock decoded by the video decoder (18) by transforming the macroblock into a corresponding picture structure to the compressed video bit stream (col. 11, lines 39-49), and

Florencio et al teaches a video transcoder comprising a bit rate control unit (Fig. 3, elements 32, 34) controlling quantization (Fig. 10, 172) of the video encoder (174) by calculating a bit amount encoded (Fig. 11, 178) substantially by every picture (slice; picture comprises slices) among a bit stream to the decoded currently by the video decoder (32) and finding a fullness of a buffer in the video encoder (34) using the calculated bit amount (col. 4, lines 9-25).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate the teachings of the Wells et al and Florencio et al so that the frame memory stores the down sampled macroblock as an efficient way to control the bit rate in an transcoder.

Regarding claim 32, Wells et al teaches the video preprocessing unit transforming a block output from the video decoder into a smaller block (col. 11, lines 39-49).

Regarding claim 33, Wells et al teaches the video preprocessing unit carrying out 2-dimensional (vertical and horizontal) down sampling (col. 11, lines 39-49).

Therefore, it would have been considered an obvious design choice for Wells et al's video preprocessing unit to carry out 1-dimensional down sampling vertically or horizontally as desired by a user.

Regarding claims 34 and 35, according to MPEG-2 standard, each macroblock includes a 16x16 array of luminance samples and each block or array of 8x8 chrominance samples (col. 1, lines 44-49).

Therefore, it would have been obvious for Wells et al's video preprocessing unit to carry out down sampling of a luminance signal and a chrominance signalin order to conform with the encoding standard.

Regarding claims 37-39, Eyuboglu et al discloses inter/intra indicator (616).

Furthermore, it is well known in the encoding standard that an I picture/frame is typically considered anchored picture, and therefore, intra-coded, and P (predictive) and

B (bidirectional) picture are normally subject to motion compensation, and therefore inter-coded.

Therefore, it would have been obvious for the transcoding parameter control unit to control video encoder so as to intra-code macroblocks output from the frame memory when a currently decoded picture from the video decoder is an I picture, and carry out MC of previously decoded macroblocks corresponding to the macroblocks to be encoded currently when the currently decoded picture type output from the decoder is a P picture or a B picture.

As per claim 39, it would have been considered an obvious design choice for the transcoding parameter control unit to control video encoder so as to intra-code macroblocks to be encoded currently when at least 3 intra macroblocks exist in the previously decoded 4 macroblocks corresponding to the macroblock to be encoded currently for encoding efficiency as desired by a user.

5. Claims 2 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyuboglu, Wells et al, and Florencio et al as applied to claims 1 and 30 above, respectively, and further in view of Wine et al (5,253,041).

Regarding claims 2 and 31, the combination of Eyuboglu , Wells et al, and Florencio et al does not particularly disclose the preprocessing unit carrying out a down sampling through a field based processing if the data decoded in the video decoder is an interlaced sequence.

However, Wine et al teaches a video compressor comprising a video preprocessing unit carrying out a down sampling through a field based processing based on the interlaced sequence (Fig. 7, 41 and 42).

Furthermore, in an encoding standard such as MPEG, a field based processing utilizes an interlacing sequence, whereas a frame based processing utilizes a sequential (progressive) scanning sequence.

Therefore, it would have been obvious for Wells et al's video preprocessing unit would carry out down sampling through a field based processing if the data decoded in the video decoder is a frame picture in an interlacing sequence or carry out down

sampling through a frame based processing if the data decoded in the video decoder is a field picture having a sequential scanning sequence in order to conform with the encoding standard.

6. Claims 7 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyuboglu , Wells et al, and Florencio et al as applied to claims 1 and 30 above, respectively, and further in view of Golin (6,058,143).

Regarding claims 7 and 36, Eyuboglu et al teaches a transcoding parameter control unit (616) and a motion vector (Fig. 6, see MOTION VECTORS) of a macroblock using motion information of a previous bit stream decoded by the video decoder (602).

Furthermore, Golin teaches a transcoding parameter control unit (Fig. 2, 205) and a motion vector of a macroblock using motion information of a previous bit stream decoded by the video decoder (202) (col. 3, lines 1-59). Golin also teaches multiple motion vectors being associated with a given block in some prediction (motion) modes, such as field prediction and dual prime for P-pictures, and deciding whether to use forward and/or backward prediction for B-pictures (col. 6, lines 27-39).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing Eyuboglu et al's trancoding scheme to incorporate the teaching of Golin so that the transcoding parameter control unit establishes the motion vector and the motion mode of the macroblock down-sampled by Well et al's preprocessing unit using motion information of the previous bit stream variable length decoded by the video decoder as a most efficient way to determine a transcoding parameter.

7. Claims 18-19, 22, and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyuboglu , Wells et al, and Florencio et al as applied to claim 1 above, and further in view of Applicant's admitted prior art.

Regarding claims 18 and 40, Eyuboglu et al discloses a video bit stream VLC in the video encoder (Fig. 6, 608).

Florencio et al teaches the bit rate control unit comprising picture bit counting unit (Fig. 11, 178) calculating a bit amount encoded substantially for each picture (slice;

picture comprises slices) in a video bit stream inputted to the video decoder and to be encoded currently, and

a buffer in the video encoder (34) finding a target bit number (col. 4, lines 9-25). for a picture to be encoded using the bit amount calculated by the picture bit counting unit and a video bit stream in the video encoder, and then calculating the fullness of the buffer in the video encoder (34) using the found target bit number (col. 4, lines 9-25).

the combination of Eyuboglu , Wells et al, and Florencio et al does not particularly disclose a reference quantizing parameter calculating unit calculating a reference quantizing parameter in accordance with buffer fullness outputted from the buffers;

an activity calculating unit producing an activity if a video outputted from the video decoder; and

quantizing parameter generating unit generating a quantizing parameter to be used for a substantial quantization in accordance with the calculated reference, quantizing parameter and the calculatd activity so as to control a quantization of the video encoder.

However, Applicant's admitted prior art teaches a reference quantizing parameter calculating unit (Fig. 1, 51) calculating a reference quantizing parameter in accordance with buffer fullness outputted from the buffer (40);

an activity calculating unit (52) producing an activity if a video outputted from the video decoder (10); and

quantizing parameter generating unit (53) generating a quantizing parameter to be used for a substantial quantization in accordance with the calculated reference, quantizing parameter and the calculated activity so as to control a quantization (Q) of the video encoder.

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate the teaching of the Applicant's admitted prior art so that the reference quantizing parameter calculating unit calculates a reference quantizing parameter in accordance with buffer fullness outputted from the buffer, an activity calculating unit produces an activity of a video

outputted from the video decoder, and quantizing parameter generating unit generates a quantizing parameter to be used for a substantial quantization in accordance with the calculated reference, quantizing parameter and the calculated activity so as to control a quantization (Q) of the video encoder as an efficient way to determine a transcoding parameter.

Regarding claims 19 and 41, Eyuboglu et al discloses a picture_start_code (col. 10, lines 32-33) in the video bitstream.

Florencio et al teaches the bit rate control unit comprising picture bit counting unit (Fig. 11, 178).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate the teaching of the Florencio et al so that the picture bit counting unit detects a picture_start_code in the video bitstream inputted to the video decoder and counts to output a bit number between the detected picture_start_code and a next picture_start_code, as an efficient way to control the bit rate.

Regarding claim 22, Applicant's admitted prior art teaches the activity calculating unit receiving an output from the frame memory (Fig. 1, 20), finds the activity of the macroblock to be encoded currently, and outputs the normalized activity to the quantizing parameter generating unit (50)(page 9, [0027]).

Furthermore, the Examiner takes official notice that determining a value of an average activity of a macroblock to be encoded/decoded is well known in the art. (see, Horiike et al, (6,044,115)).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate the teaching of the Applicant's admitted prior art and the Examiner's official notice so that the initial value of an average value of the activities used for the activity normalization is set up by finding an average activity of a macroblock to be decoded into an original resolution, as an efficient way to control the bit rate.

Allowable Subject Matter

8. Claims 3-6, 8-17, and 20-21 are objected to as being dependent upon a rejected base claim 1, but would be allowable: if any one of the claims 3, 8, and 20 is rewritten in independent form including all of the limitations of the base claim 1 and any intervening claims.

Dependent claims 3-6, 8-17, and 20-21 recite novel features, wherein the art of records fail to anticipate or make obvious.

Accordingly, if the amendments are made to the claims listed above, and if rejected claims are canceled, the application would be placed in condition for allowance.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to *Shawn S. An* whose telephone number is 571-272-7324.

11. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Please note a new fax number.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SHAWN AN
PRIMARY EXAMINER

8/18/05